

**CORONA DIVISION  
NAVAL SURFACE WARFARE CENTER**



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**MAKING SEA POWER 21 A REALITY**



# Technical Considerations for IUID Implementation

**NSWC Corona  
Product Engineering Department  
30 July 2009**

# NSWC Corona IUID Center



Implementation Assistance  
Consumer Reports  
IUID Community  
Innovation  
Training

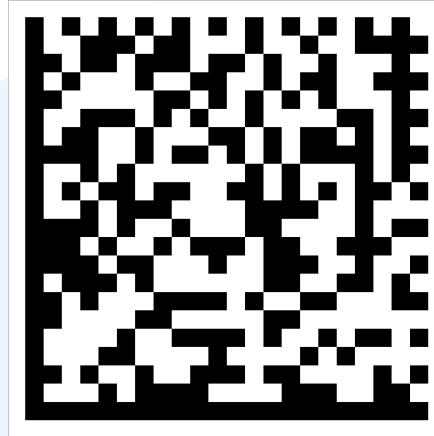
**Our mission is to provide expertise in mission-focused lifecycle management through IUID integration.**



# Intemporaliter Singularis

If nothing else,  
make sure the IUID is both  
unique  
and  
permanent

# Turning a Data Matrix into an IUID



The right information  
encoded into the right  
kind of mark

## Syntax

[>R/s06G/s7LN41164G/s1PT123G/sS531R/sEoT

Format Code:

Data Identifiers:

Enterprise Identifier:

Part Number:

Serial Number:

**Unique Item Identifier (UII) : LDN41164T12**

# The Legacy Duplication Problem

## Construct #1:

[]><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>25S**EnterpriseID****SerialNumber**<sup>R</sup>/<sub>S</sub><sup>E</sup><sub>O\_T</sub>

## Construct #2:

[]><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>7L**EnterpriseID**<sup>S</sup>/<sub>S</sub>1P**PartNumber**<sup>G</sup>/<sub>S</sub>S**SerialNumber**<sup>R</sup>/<sub>S</sub><sup>E</sup>

## Possible Enterprise IDs

CAGE Code  
NCAGE Code  
DUNS  
DODAAC  
GS1 Company Prefix

**Must use the EID of the group  
ensuring uniqueness of the IU**

(Almost always DODAAC for legacy hard

# Solving The Legacy Duplication Problem

## Construct #1:

[]><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>25SLD**N641264**SerialNumber<sup>R</sup>/<sub>S</sub><sup>E</sup>O<sub>T</sub>

Obtain a new DODAAC

Use an “Enterprise” generated serial number  
to accompany the MFR serial number  
(e.g. “program code” + “database primary key”)

## Construct #2:

[]><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>7L**N641264**<sup>G</sup>/<sub>S</sub>P1PartNumber<sup>R</sup>/<sub>S</sub>SerialNumber<sup>R</sup>/<sub>S</sub>

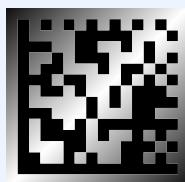
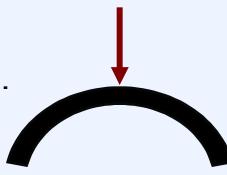
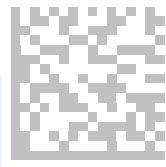
Obtain a new DODAAC

**CAUTION!**

- \*PN/SN must be unique w/in program
- \*PN/SN cannot have “special” characters
- \*PN/SN cannot be too long (42 chars)

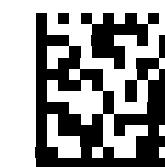
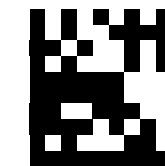
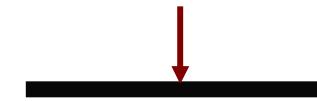
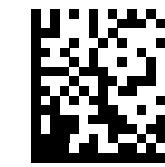
# Readability Of The Mark

**Hard Read**



**Expensive Readers**

**Easy Read**



**Cheap Readers**

**Contrast**

**Shape**

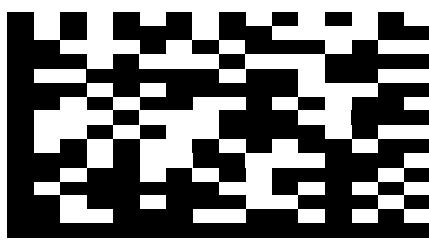
**Cell Size**

**Reflectance**

**...Verified!**

# Verification

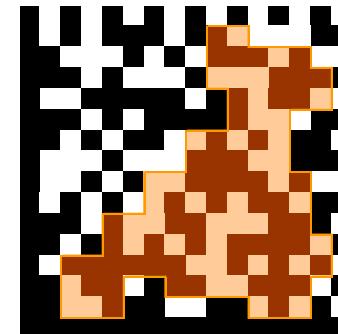
“...the symbol shall have a minimum print quality of 3.0/05/660, ...”  
So Sayeth MIL-STD-130



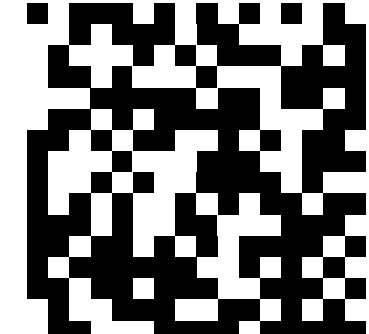
Axial  
Non-  
uniformity



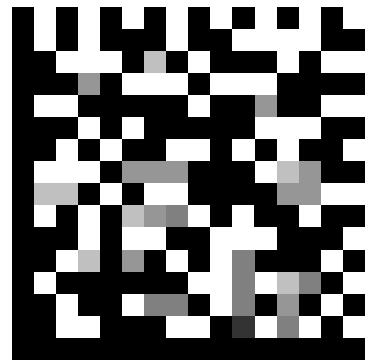
Grid  
Non-  
uniformity



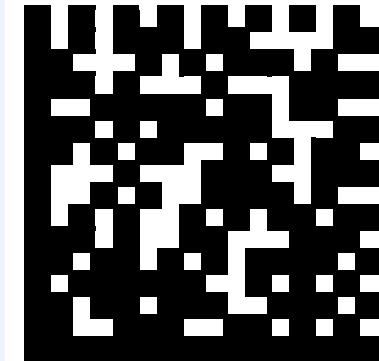
Unused  
Error Correction



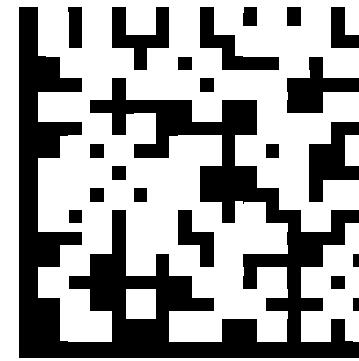
Fixed Pattern  
Damage



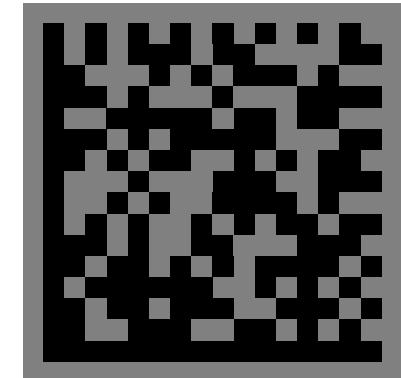
Modulatio



Over-print

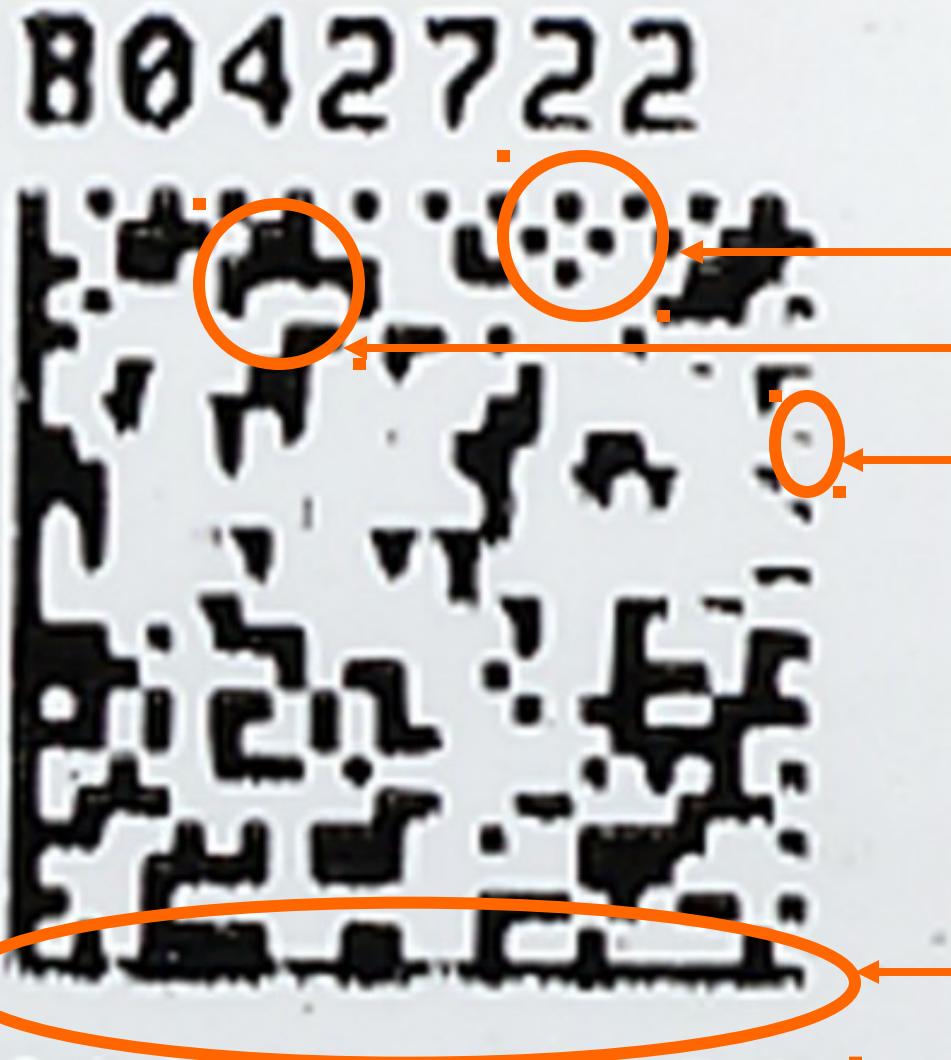


Under-  
print



Contrast

# A Readable, Failing Mark



UNDER PRINT  
OVER PRINT

CLOCKING PATTERN  
DAMAGE

FINDER PATTERN  
DAMAGE

# It Starts With the Mark

## Labels



## Data Plates



## Direct Part Marking





# Top 5 Label Mistakes

- **Not protecting labels in a hydraulic fluid environment (a smudge kills a datamatrix)**
- **Using a label in an non-breathable space without engineering analysis**
- **Using labels older than 1 year**
- **Neglecting to clean hands and/or part**
- **Mismatch of adhesive or label stock to part**

# Top 4 Data Plate Problems

- **Use of aluminum plates riveted to non-aluminum metallic parts (corrosion)**
- **Over-estimating abrasion resistance**
- **Use of epoxies (thermal expansion differences)**
- **Under-estimating labor (hand cut adhesive foam)**



# Top 4 Direct Part Marking Issues

- Engineering review often necessary
- Required skill level - High
- Part variability very hard to control/detect
- Contrast / Durability tradeoff

# QUESTIONS & ANSWERS